

REMARKS

Claims 1-53 are pending. Of these, claims 28-53 are withdrawn. By this Amendment, the Abstract and claims 1-3 and 13-15 are amended. No new matter has been added.

The amendments to claims 1-3 and 13-15 are supported, for example, on page 19, lines 7-27.

The Applicant thanks Examiner Zarneke for the courtesies extended to Applicant's representative during the March 5, 2004 personal interview. The points discussed are incorporated into the remarks below and constitute the Applicant's record of the interview.

An Information Disclosure Statement was filed on December 12, 2000 in which JP-60-244094 was cited. Subsequently, on June 27, 2001 another Information Disclosure Statement was filed citing JP A 60-244094 (abstract only). Accompanying the Office Action mailed December 10, 2003 were initialed Forms PTO-1449. The Form PTO-1449 filed December 12, 2000 was completely initialed whereas the Form PTO-1449 accompanying the June 27, 2001 filing did not initial JP A 60-244094 (abstract only). Attached is a copy of that Form PTO-1449. It is respectfully requested that the abstract only for the Japanese reference also be initialed indicating that the Examiner has considered both the Japanese reference and the English language abstract.

For the following reasons, Applicant submits that this Application is in condition for allowance.

I. The Claims Define Allowable Subject Matter

On page 2 of the Office Action, the Office Action indicates that the election/restriction requirement is made final, but indicates on page 3 that non-elected claims 28-53 must be canceled in reply to the Final Rejection. Applicant respectfully notes that the

Office Action is a non-final Action and the requirement is premature. Consequently, the withdrawn claims are pending.

On page 3 of the Office Action, claims 1, 4, 7, 10, 13, 16, 19, 22 and 25 are rejected under 35 U.S.C. §103(a) over JP 11-040620 to Murakami et al. (hereinafter "Murakami"). The rejection is respectfully traversed.

Applicant respectfully submits that Murakami fails to disclose a semiconductor device or a mounting substrate, wherein the first plating layer is more appropriate for contact with the resin than the second plating layer, and the second plating layer is more appropriate for bonding to the conductive material than the first plating layer, as respectively recited in claims 1 and 13.

As discussed at the interview, the specification fully supports and apprises one of ordinary skill in the art the scope of the claims. Specifically, on page 3, lines 1-4 of the Office Action, it is disclosed that a plating layer having appropriate adhesion properties with a resin and a plating layer having appropriate adhesion with the conductive material commonly require different properties. Therefore, the claimed invention provides for such by means of a first and second plating layer of different properties.

Applicant further notes the first plating layer is more appropriate for contact with the resin than the second plating layer, but the second plating layer is more appropriate for bonding to conductive material than the first plating layer. There is a difference because, as disclosed in page 19, lines 7-27 of the specification, the first plating layer prevents oxidation at least over the land and further ensures good conduction as well as lowers the electrical contact resistance. Further, the first plating layer additionally allows the intimate contact with the resin on the interconnect to be obtained (page 19, lines 7-11). On the other hand, the second plating layer is appropriate for bonding to the conductive material (page 19, lines 20-21).

Therefore, by reciting contact instead of merely bonding, Applicant respectfully submits the first plating layer must accommodate several different properties so that the first plating layer can be more appropriate for contact with the resin than the second plating layer in terms of at least conduction, electrical contact resistance, as well as, adhesion. Such properties are not an inherent property of the first plating layer. They depend on the interaction of the material used for the first plating layer and the type of resin used.

Murakami fails to disclose that the first plating layer is more appropriate for contact with the resin than the second plating layer. Instead, Murakami discloses a film 3, a beer hole 10 (translation), a lead 4, tin plating 13, beer plating 18, a semiconductor chip 1, and terminal 5 (Figs. 7-8, paragraph [0048]). The Office Action acknowledges that Murakami fails to teach the use of resin on the first plating layer, however, it asserts that it would be obvious to modify Murakami to make up for this deficiency. Applicant respectfully submits the use of resin on the first plating layer is not obvious and Murakami specifically teaches away from using a closure resin 15 as undesirable because the use of closure resin 15 causes enlargement of the part to which the wiring substrate with a ball terminal 31 that supports the closure edge of the closure resin 15 compared to that of the semiconductor, increasing the cost of fabrication (paragraph [0007]).

Further, Murakami discloses that "the wiring protective coat 8 of the insulation from which it pulls out and the lead 4 and the cash drawer lead 4, and the ball formation pad 11 are protected wired so that the ball formation pad 11 and the junction pad 6 which are joined to the fraction inserted into the beer hole 10 of the ball terminal 5, and the ball formation pad 11 might be connected" ([0014]). Further, "the insulation wiring protective coat 8 which protects the cash drawer lead 4 and the ball formation pad 11 is formed in order to prevent electric shunt by contamination of wiring side (front face) of a film 3,... is not necessarily required" [0018].

All of the above discussions in Murakami fails to disclose any characteristics or relationships between a first plating layer and a resin to allow for more appropriate contact as recited in the claims and defined in the specification.

Therefore, as Murakami fails to suggest use of a resin and moreover, a resin for which a first plating layer is more appropriate for contact with a resin than the second plating layer, claims 1 and 13 are patentable over the applied reference. Claims 4, 7, 10, 22 and 25, which depend from claim 1, and claims 16 and 19, which depend from claim 13, are likewise patentable over the applied reference for at least the reasons discussed above and for the additional features they recite. Withdrawal of the rejection is respectfully requested.

On page 5 of the Office Action, claims 2, 3, 5, 8, 9, 11, 12, 14, 15, 17, 18, 20, 21, 23, 24, 26 and 27 are rejected under 35 U.S.C. §103(a) over EP 810656 to Fukuda. The rejection is respectfully traversed.

Applicant respectfully submits that Fukuda fails to disclose a semiconductor device or a mounting substrate, wherein the first plating layer is more appropriate for contact with a resin than the second plating layer, and the second plating layer is more appropriate for bonding to the conductive material than the first plating layer, as respectively recited in claims 2, 3, 14 and 15.

Corresponding to the above discussion regarding Murakami, Fukuda also fails to disclose a first plating layer that is more appropriate for contact with a resin than the second plating layer, and the second plating layer which is more appropriate for bonding to the conductive material than the first plating layer.

Fukuda discloses a substrate 1, copper foil 24, copper plating 25, through hole 4, hard gold plating 3, and soft gold plating 2 (Figs. 6a-f, page 6, lines 12-35). Fukuda also discloses that a copper interconnection is formed by the copper 25 (page 6, lines 29-35). The Office Action acknowledges that Fukuda fails to disclose a conductive material provided on the

second plating layer, but asserts that it would be obvious to modify Fukuda to make-up for this deficiency.

Regarding claims 2 and 4, Applicant also notes that Fukuda fails to disclose a first interconnect pattern that is formed on one surface of the substrate and a second interconnect pattern that is formed on the other surface of the substrate, as further recited in claims 2 and 14. Instead, Fukuda discloses that both the copper foils 24 (alleged to be the first interconnect pattern) and the copper plating 25 (alleged to be the second interconnect pattern) are formed on both sides of the substrate (Fig. 6c).

Further, Fukuda fails to disclose a first plating layer which is more appropriate for contact with a resin than the second plating layer, as recited in claims 2, 3, 14 and 15. Instead, Fukuda merely discloses an adhesive 9 between the semiconductor chip 6 and the substrate 1, the resin 8 is shown as formed over the gold wire 7, the soft gold plating 2 and portions of the hard gold plating 3 (Fig. 2, col. 7, lines 46-56). However, this disclosure does not disclose that one of the gold layers, asserted to be the first plating layer, is more appropriate for contact with the resin than the second plating layer. That is, none of a soft gold with purity 99.9% or higher nor a hard gold with a purity of 99% are shown to have properties that will be improved so that it is more appropriate for contact with a resin than the second plating layer. (Col. 1, line 41 - col. 2, line 1). Fukuda merely discloses that the chip side of the substrate 1 is molded by a resin 8 that covers the semiconductor chip, (col. 1, lines 34-36).

In view of the above, Applicant submits that claims 2, 3, 14 and 15 are patentable over the applied reference. Claims 5, 8, 11, 23 and 26, which depend from claim 2, claims 9, 12, 24 and 27, which depend from claim 3, claims 17 and 20, which depend from claim 14, and claims 18 and 21, which depend from claim 15, are likewise patentable over the applied

reference for at least the reasons discussed above and for the additional features they recite.

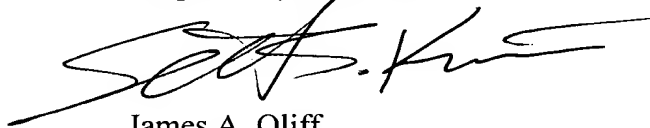
Withdrawal of the rejection is respectfully requested.

II. Conclusion

For the reasons stated above, Applicant submits that this application is in condition for allowance. Favorable reconsideration and prompt allowance are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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Attachment:

June 27, 2001 Form PTO-1449

Date: March 10, 2004

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